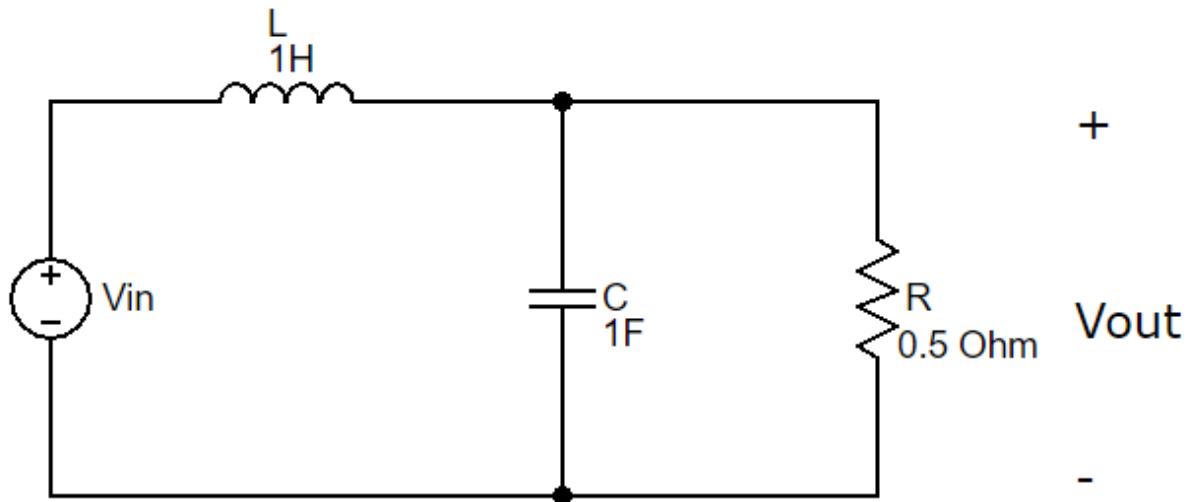
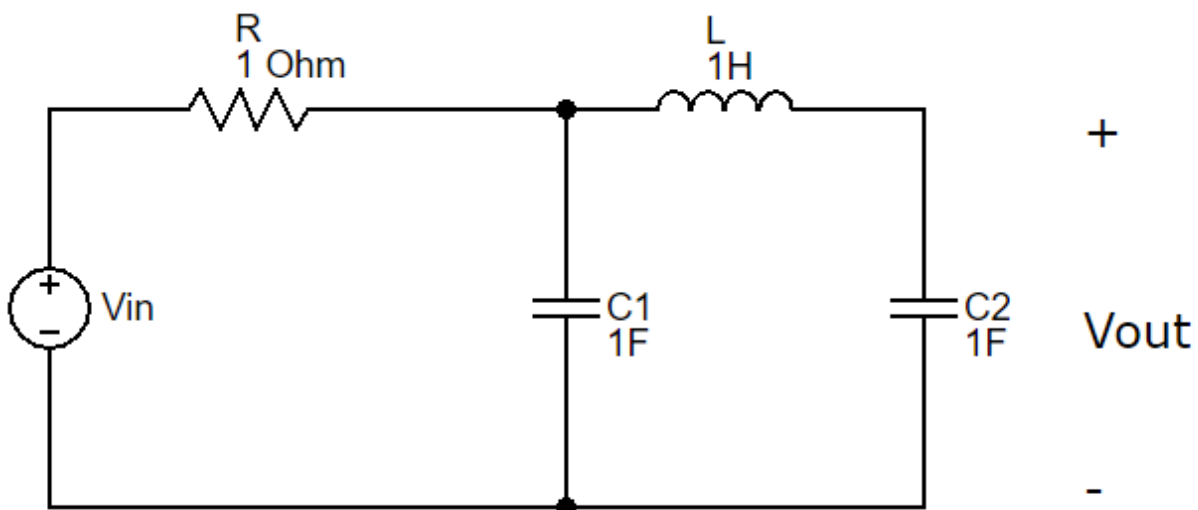


## Modeling sheet

1. Use MATLAB Simulink modeling to simulate and display the output waveform  $V_{out}(t)$  of the RLC circuit shown below using any method where  $V_{in}(t)$  is the unit step function, and the initial conditions are  $i_L(0) = 0$  and  $V_c(0) = 0.5$  V.



2. Use MATLAB Simulink modeling to simulate and display the output waveform  $V_{out}(t)$  of the RLC circuit shown below using any method where  $V_{in}(t)$  is the unit step function, and the initial conditions are  $i_L(0) = 0$  and  $V_c(0) = 1$  V.



3. Using the appropriate method, model the differential equation shown below.  
where  $u(t)$  is the input and  $y(t)$  is the output.

$$u(t) = x'''(t) + 6x'(t) + 8x(t)$$

$$y(t) = x''(t) + 2x(t)$$

4. Using the appropriate method, model the differential equation shown below.  
where  $u(t)$  is the input and  $y(t)$  is the output.

$$160u'(t) + 640u(t) = y'''(t) + 18y''(t) + 192y'(t) + 640y(t)$$

